

**REMARKS**

Applicants have canceled Claims 1-21 and 23-30 and added new Claims 31-65.

Support for new Claim 31 can be found in the originally filed Application, for example, at page 9, lines 17-21; at page 10, lines 6-30; at page 12, lines 3-18; in FIGS. 1 and 2, and in the Examples.

Support for new Claims 32-34 can be found in the originally filed Application, for example, in FIGS. 1 and 2; at page 14, line 1 through page 15, line 30 and in the Examples.

Support for new Claims 35-37 can be found in the originally filed Application, for example, at page 11, lines 12-21 and in the originally filed claims.

Support for new Claim 38 can be found in the originally filed Application, for example, at page 9, lines 22-27 and in the originally filed claims.

Support for new Claim 39 can be found in the originally filed Application, for example, at page 9, lines 5-10; at page 13, lines 16-20; and in the originally filed claims.

Support for new Claim 40 can be found in the originally filed Application, for example, at page 9, lines 5-10 and in the originally filed claims.

Support for new Claims 41-43 can be found in the originally filed Application, for example, at page 11, line 22 through page 12, line 2 and in the originally filed claims.

Support for new Claim 44 can be found in the originally filed Application, for example, at page 9, lines 5-10; and at page 13, lines 16-20.

Support for new Claims 45-47 can be found in the originally filed Application, for example, at page 9, lines 25-27 and in the originally filed claims.

Support for new Claims 48-49 can be found in the originally filed Application, for example, at page 9, lines 11-21; in the Examples, and in the originally filed claims.

Support for new Claims 50-54 can be found in the originally filed Application, for example, at page 9, lines 5-10; at page 11, lines 1-21; and in the originally filed claims.

Support for new Claim 55 can be found in the originally filed Application, for example, at page 13, lines 21-27.

Support for new Claim 56 can be found in the originally filed Application, for example, at page 9, lines 17-21; at page 10, lines 6-30; at page 14, line 1 through page 15, line 30; in FIGS. 1 and 2; and in the Examples.

Support for new Claim 57 can be found in the originally filed Application, for example, at page 11, lines 12-21.

Support for new Claims 58-59 can be found in the originally filed Application, for example, in FIGS. 1 and 2; at page 14, line 1 through page 15, line 30; and in the Examples.

Support for new Claim 60 can be found in the originally filed Application, for example, at page 10, lines 6-30; at page 12, line 19 through page 13, line 8; in FIGS. 1 and 2; at page 14, line 1 through page 15, line 30; and in the Examples.

Support for new Claims 61-63 can be found in the originally filed Application, for example, in FIGS. 1 and 2; at page 14, line 1 through page 15, line 30 and in the Examples.

Support for new Claim 64 can be found in the originally filed Application, for example, at page 11, lines 12-21.

Support for new Claim 65 can be found in the originally filed Application, for example, at page 13, lines 21-27.

#### **Rejection of Canceled Claims 1-21 and 23-30**

The Examiner had rejected Claims 1-21 and 23-30 under 35 U.S.C. § 103(a) in view of U.S. Patent No. 6,645,323 ("Flemmings, *et al.*"), U.S. Patent No. 6,742,567 ("Winterbottom, *et al.*"), U.S. Patent No. 5,701,942 ("Adachi, *et al.*"), U.S. Patent No. 5,464,053 ("Moschini"), "Efficient Formation of Structures Suitable for Semi-Solid Forming" by Martinez, *et al.*, AMS Metals Handbook, 9<sup>th</sup> Ed., Vol. 15, Casting, U.S. Patent No. 6,908,590 ("DasGupta"), and EP 0 745 694, in various combinations.

Applicants have canceled the rejected claims and added new Claims 31-61. Applicants submit that new Claims 31-65 are patentable over each of the references previously cited by the Examiner, alone or in combination. For example, none of the cited references, alone or in combination, teach or suggest directing a superheated metal alloy into a nucleation reactor having a plurality of intersecting inner channels, or passively mixing the superheated metal alloy

via fluid impingement and convection with the nucleation reactor, as stated in new independent Claim 31.

Furthermore, none of the cited references teach or suggest the specific nucleation reactor claimed in new Claims 32-34. Also, none of the cited references teach or suggest directing a superheated metal alloy into the nucleation reactor as described in new independent Claim 56 or cooling a superheated alloy within such a nucleation reactor as also described in new Claim 56.


None of the cited references teach or suggest directing a first superheated metal and a second superheated metal into a nucleation reactor having a plurality of intersecting inner channels, or passively mixing the first and second metals via fluid impingement and convection with the nucleation reactor, as stated in new independent Claim 60.

### CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner believes that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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